

**UNITED STATES DISTRICT COURT  
DISTRICT OF MINNESOTA**

Everspin Technologies, Inc.,

Plaintiff,

v.

**MEMORANDUM  
OPINION AND ORDER**  
Civil No. 12-474 ADM/FLN

NVE Corporation,

Defendant.

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Benjamin G. Damstedt, Esq., Timothy S. Teter, Esq., Jeffrey S. Karr, Esq., Nathan K. Cummings, Esq., Cooley LLP, Palo Alto, CA; Kurt J. Niederluecke, Esq., Grant D. Fairbairn, Esq., Ted C. Koshiol, Esq., Fredrikson & Byron, PA, Minneapolis, MN, for Plaintiff.

David R. Fairbairn, Esq., Catherine A. Shultz, Esq., Katherine J. Rahlin, Esq., Stuart A. Nelson, Esq., Kinney & Lange, PA, Minneapolis, MN, for Defendant.

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**I. INTRODUCTION**

On August 22, 2013, a claim construction hearing was held before the undersigned United States District Judge in a patent infringement action brought by Plaintiff Everspin Technologies, Inc. (“Everspin”) against Defendant NVE Corporation (“NVE”). Everspin alleges NVE infringes claims of U.S. Patent Nos. 5,861,328 (the “328 Patent”) and 5,831,920 (the “920 Patent”).

**II. BACKGROUND**

Plaintiff Everspin has described, and Defendant NVE has not contested, some technological background that undergirds the two Patents. Pl.’s Opening Claim Constr. Br. [Docket No. 48] (“Pl.’s Br.”) 2-3. Magnets, more particularly magnetic fields, affect the flow of electrical current through conductive materials. Id. In the late 1980s, scientists discovered the giant magnetoresistance (“GMR”) effect. The GMR effect occurs in stacks of magnetic layers

separated by non-magnetic electricity-conducting layers. Id. at 4. When electrical current flows through the stack, the cumulative resistance of the conductive material and the magnetic field depends on the orientation of the magnetic layers. Id. If the magnetic layers are oriented in the same direction, resistance is relatively low. Id. at 5. However, if the orientation of the magnets is in opposite directions, the resistance is relatively high. Id. Inventors and developers have discovered how to use the GMR effect to write, store, and read data. “Writing” data involves switching the relative states of the magnetic directions between low and high resistance configurations. Id. “Reading” data involves applying current through a GMR memory cell and measuring the voltage as indicating either the low-resistance or high-resistance configuration. Id. Processors read the data as the “0s” and “1s” that comprise the basic binary computer language. Id.

The ’328 Patent, entitled “Method of Fabricating GMR Devices,” describes a manufacturing process by which the GMR effect is integrated with a semiconductor to form an integrated circuit with GMR layers as the memory element. Decl. Katherine J. Rahlin [Docket No. 45] Ex. B (’328 Patent) at 1:4-8. Integrating the GMR memory elements and the circuitry presents several manufacturing challenges. GMR materials are relatively delicate and require processing temperatures to be less than 300 degrees Celsius. ’328 Patent at 1:28-30; ’920 Patent at 1:39-40. On the other hand, higher temperatures improve the functionality of a semiconductor and the material typically connecting a semiconductor to GMR material. ’328 Patent at 1:19-25. The ’328 Patent’s method covers a process for insulating the more delicate GMR materials against the higher temperatures more optimal for joining the other materials. Id. at 1:55-67. The

'328 Patent's method also attempts to insulate the GMR materials from damaging oxidizing and corrosive processes that are part of the manufacturing. Id. 1:46-49.

The '920 Patent, entitled "GMR Device Having a Sense Amplifier Protected by a Circuit for Dissipating Electric Charges," describes GMR material applied to magnetic random access memory ("MRAM"). Id. Ex. A ('920 Patent) at 1:5-10, 13-16. The '920 Patent's focus is the addition of a charge dissipating circuit that is intended to protect the application from excess electrical charges. Id. In its introduction to the preferred embodiments, the patentee states:

"GMR materials are used in various kinds of devices such as memories and sensors. This patent application describes embodiments formed into a MRAM device, for example. It should be understood that the present invention is easily applied to the sensor device instead of MRAM."

Id. at 2:57-61.

On May 20, 2013, Everspin and NVE filed a Joint Claim Construction Statement identifying 10 disputed terms in the '328 and '920 Patents. See Joint Claim Constr. Stmt. [Docket No. 40]. The parties agree that the term "a magnetic element magnetically changing resistance in magnetic material according to an applied magnetic field" in Claim 1 of the '920 Patent means "a component that changes its resistance when subjected to an applied magnetic field." Id. at 1. The parties agree that the term "so as to seal the cell and provide a barrier to ambient conditions" in Claim 25 of the '328 Patent means "covering the cell so that it is protected from moisture, oxidation, and corrosive agents during subsequent manufacturing operations and permanent use." Id. at 2.

### III. DISCUSSION

#### A. Standard of Review

Claim construction is a matter of law. Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995), aff'd, 517 U.S. 370 (1996). In construing claims, courts should look first to intrinsic evidence, which includes the claims, the specification, and the prosecution history. Vitrionics Corp. v. Conceptor, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996). Claim terms are “generally given their ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” Phillips v. AWH Corp., 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (quotation and citations omitted). However, a patentee can choose to be “his or her own lexicographer by clearly setting forth an explicit definition for a claim term.” Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985, 989 (Fed. Cir. 1999). Claim terms “should be construed consistently with [their] appearance in other places in the same claim or other claims of the same patent.” Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1342 (Fed. Cir. 2001). In addition, the specification is usually “dispositive; it is the single best guide to the meaning of a disputed term.” Vitrionics, 90 F.3d at 1582. Courts are nonetheless cautioned not to import limitations from the specification into the claims. Phillips, 415 F.3d at 1323; Laitram Corp. v. NEC Corp., 163 F.3d 1342, 1347 (Fed. Cir. 1998).

While courts can consider extrinsic evidence to educate themselves about the patent and technology at issue, it is improper to rely on extrinsic evidence in construing claims unless, after consideration of all the intrinsic evidence, ambiguity remains. Mantech Envtl. Corp. v. Hudson Envtl. Servs., Inc., 152 F.3d 1368, 1373 (Fed. Cir. 1998); Vitrionics, 90 F.3d at 1584. Extrinsic

evidence is “evidence which is external to the patent and file history, such as expert testimony, inventor testimony, dictionaries, and technical treatises and articles.” Vitronics, 90 F.3d at 1584. Dictionaries may be useful to courts in understanding the ordinary and customary meaning of words, and courts may “rely on dictionary definitions when construing claim terms, so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents.” Phillips, 415 F.3d at 1322-23.

## **B. Claim Construction**

### **1. “Magnetic memory device” in Claim 25 of the ’328 Patent**

Everspin submits that the term “magnetic memory device” does not need to be construed. Joint Claim Constr. Stmt. Ex. 1 (“Joint Stmt.”) at 14. NVE submits that the term means “A piece of equipment primarily intended to store data in a magnetic form that can be sensed at a later time.” Id.

“Magnetic memory device” appears in the preamble of Claim 25 of the ’328 Patent. As a general rule, preamble language is not treated as limiting. Aspex Eyewear, Inc. v. Marchon Eyewear, Inc., 672 F.3d 1335, 1347 (Fed. Cir. 2012). Only if a preamble “recites essential structure or steps, or if it is necessary to give life, meaning, and vitality” to the claim is it to be considered limiting and in need of construction. Catalina Mktg. Int’l v. Coolsavings.com, Inc., 289 F.3d 801, 808 (Fed. Cir. 2002) (internal quotation and citation omitted). Furthermore, preamble language cannot be considered limiting if the claim describes a “complete invention and uses the preamble only to state a purpose or intended use for the invention.” Id.

The preamble to Claim 25 of the ’328 Patent begins: “A method of fabricating magnetic memory devices comprising the steps of: . . . ,” followed by the body of the claim. ’328 Patent at 11:12-3. The preamble describes a purpose of the claim and does not limit it. If the words

“fabricating magnetic memory devices” were removed, the claim would still stand independently as a description of a method of fabricating GMR devices. “Magnetic memory device” adds nothing to the reader’s understanding of the invention, and it does not recite essential structure or steps. “Magnetic memory device” need not be construed by the Court.

If the term “magnetic memory device” were to be construed, it could not be as, “A piece of equipment primarily intended to store data in a magnetic form that can be sensed at a later time.” Joint Stmt. at 14 (emphasis added). As discussed below in section B.2, a “primarily” standard for memory is unworkable and unnecessary.

## **2. “Magnetic memory cell” in Claim 25 of the ’328 Patent and “memory cell” in Claims 6 and 15 of the ’920 Patent**

NVE and Everspin submit parallel arguments for both “magnetic memory cell” in Claim 25 of the ’328 Patent and “memory cell” in Claims 6 and 15 of the ’920 Patent. Everspin contends that a “memory cell” is “a device that possesses more than one stable state and can store at least one item of information” in the ’920 Patent and a “magnetic memory cell” is “a device that possesses more than one stable magnetic state and can store at least one item of information” in the ’328 Patent. Joint Stmt. at 12-13, 15-17. NVE submits that the Court construe “memory cell” as “primarily used for storing information” in the ’920 Patent and “primarily used for storing information in a magnetic form” in the ’328 Patent. Id.

NVE’s construction is unworkable because determining when a “memory cell” was used primarily for storage would require creating a sorting standard from whole cloth without a basis for doing so. NVE’s definition also does not actually help define the term. NVE has not suggested when a memory device, element, or cell would cross the line into “primarily for storage,” but NVE argues that if the Court does not make this determination then any device

with an “on/off” switch could be considered a memory device. Def.’s Resp. Claim Constr. Br. [Docket No. 52] (“Def.’s Resp.”) 14-15. On the other hand, Everspin’s definition is too broad. For example, under its definition, even quarters could become memory cells. A quarter laid on a table has two stable states, “heads” or “tails.” If “heads” means “0” and “tails” means “1,” then storage of “1s” and “0s” is just a matter of placing the coins on a table in the orientation preferred, perhaps according to a predetermined code. Any person knowing the code could retrieve the piece of information, “0” or “1,” from each quarter based on reading its “stored” orientation, “heads” or “tails.” But concerns about this broad definition of “memory cell” need not cause an existential crisis. Terms are not used in isolation, but rather depend on the context of the patents’ claims language.

The ’328 Patent and the ’920 Patent do not explicitly define “memory cell” because those skilled in the art understand the term in context. See ’328 Patent 1:66-67; 2:41; 3:63; 4:2, 36-39, 43, 59; 6:16; Claims 1, 13-17, 20-21, 23, 25, 28; see ’920 Patent Claims 6, 15. “Memory cell” is neither so broad as Everspin’s definition may be interpreted to allow, nor so narrow as NVE’s definition. “Memory cell” will be accorded its plain meaning.

### **3. “An input”/“the input” in Claims 1, 3, 5, 9, 11, 14, and 18 of the ’920 Patent**

Everspin argues the term “input” in Claims 1, 3, 5, 9, 11, 14, and 18 of the ’920 Patent does not require construction and should be given its plain meaning. Joint Stmt. at 1. NVE proposes “input” means:

The terminal through which an input signal from a magnetic element is supplied to a gate of an input stage MOS transistor of an amplifier.  
The charges dissipating circuit is connected to the same input of the amplifier as the magnetic element.

Id.<sup>1</sup>

NVE argues that the '920 Patent defines this term by implication and through the term's consistent use throughout the '920 Patent. Def.'s Opening Claim Constr. Br. [Docket No. 44] ("Def.'s Br.") 13 (citing Bell Atl. Network Servs. v. Covad Commc'ns. Grp., 262 F.3d 1258, 1273 (Fed. Cir. 2001)). This definition by implication follows the exact steps described in the embodiment. '920 Patent at 4:62-5:4. However, as Bell Atlantic dictates, the Court should delve into meanings by implication only if the patentee has chosen to give a term an unconventional meaning, and, only if the intrinsic evidence shows that the patentee "clearly redefine[s] a claim term so as to put one reasonably skilled in the art on notice that the patentee intended to so redefine the claim term." Bell Atl., 262 F.3d at 1268. No evidence or argument has been presented that the patentee intended to use "input" in an unconventional way. NVE's argument attempts to narrow the definition of "input" by tying the term to the preferred embodiment descriptions. The Federal Circuit cautions that "although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments." Phillips, 415 F.3d at 1323. Furthermore, extrinsic evidence supports the finding of plain meaning. Both parties cite to dictionary definitions that state "input" means "the terminals to which the power or signal is applied." See McGraw Hill Dictionary of Scientific Terms (4th ed. 1989); McGraw Hill Dictionary of Scientific and Technical Terms (5th ed. 1994). The '920 Patent uses the term "input" according to its plain and usual meaning; therefore, it does not need further construction.

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<sup>1</sup> MOS is an acronym for metal-oxide semiconductor.



#### **4. “Coupled” in Claims 1, 3, 9, 11, and 18 of the ’920 Patent**

Everspin proposes “coupled” in Claims 1, 3, 9, 11, and 18 means “the association of two or more circuits or systems in such a way that power or signal information may be transferred from one to another.” This definition is from the Institute of Electrical and Electronics Engineers Standard Dictionary of Electrical and Electronics Terms (6th ed. 1996). Joint Stmt. at 4. NVE argues “coupled” means “electrically connected.” Id.

Claim 1 uses the term “coupled” twice in phrases that are disputed and discussed further in Sections B.5 and 6. The first phrase is “an amplifier having an input, the input being coupled to the magnetic element, for sensing resistance in the magnetic element.” ’920 Patent 5:10-12 (emphasis added). The second phrase is “a charges dissipating circuit, coupled to the input of the amplifier, for dissipating charges applied to the input” Id. at 5:13-14 (emphasis added). As NVE suggests, the word “coupled” can be exchanged in this context for the word “connected.” Def.’s Br. 16-17 (citing Patent Nos. 5,702,831 and 5,699,293, which are fully incorporated in the ’920 Patent). The claim language is plain. The amplifier, a term discussed further in section B.5, has an input connected to the magnetic element and there is a second connection between the dissipating circuit and the amplifier. Claim 9 has a third example, describing an input “being coupled to a reference element.” ’920 Patent at 5:45-48. The specifications describe these connections in more detail as part of the preferred embodiments, but nowhere do the specifications explicitly limit the claims to a particular type of current running through the coupling. That all of the connections in the embodiment are electrical does not limit the term “coupled” to NVE’s preferred description of “electrically connected.” Even though the specification is usually the “best guide” to the meaning of a disputed terms, the Federal Circuit

has cautioned against importing limitations from the specifications into the claims.<sup>2</sup> Phillips, 415 F.3d at 1323. Where, as here, the specifications do not discuss the form of current traveling through a coupling, the Court will not import the “electrical” description to “coupling.”

“Coupled” is not a complex or sophisticated term in the context of the ’920 Patent, and should have its plain meaning as interpreted by a person of ordinary skill in the art. Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1477 (Fed. Cir. 1998) (“It is the person of ordinary skill in the field of invention through whose eyes the claims are construed.”). Although the term “coupled” can be used to connect multiple elements with multiple types of current, inventors are “free to choose a broad term and expect to obtain the full scope of its plain and ordinary meaning. . . .” Thorner v. Sony Computer Entm’t Am. LLC, 669 F.3d 1362, 1367 (Fed. Cir. 2012).

**5. “An amplifier”; “an amplifier having an input . . . for sensing resistance in the magnetic element”; and “an amplifier having an input, the input being coupled to the magnetic element, for sensing resistance in the magnetic element” in Claims 1, 3, 9, 11, and 18 of the ’920 Patent**

Everspin argues “an amplifier” in Claims 1, 3, 9, 11, and 18 does not require construction and should be given its plain meaning. Joint Stmt. at 6. NVE proposes “an amplifier” is “a device having an input stage MOS transistor with a gate that receives, at an input, an input signal from the magnetic element, and produces, at an output, an amplified output signal based on the input signal.” Id. The parties also dispute whether, in Claim 1, the Court should construe the whole phrase “an amplifier having an input, the input being coupled to the magnetic element, for

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<sup>2</sup> Everspin is concerned that NVE’s proposed construction is not “electrically connected” but rather, “direct electrical connection.” Pl.’s Br. 11. But, the word “direct” does not appear in NVE’s briefing.

sensing resistance in the magnetic element” or the shortened phrase “an amplifier having an input . . . for sensing resistance in the magnetic element.” Id. at 4-8. Everspin argues that only the shortened phrase should be construed, and that it means “A device that detects and amplifies voltages to determine resistance in the magnetic element coupled to its input.” Id. at 4, 8.

Conversely, NVE argues that the whole phrase should be construed and contends that it means:

The amplifier is a device that receives an input signal at an input and produces an amplified output signal at an output. The amplifier is of a type that has an input stage MOS transistor with a gate at the input.

The input is connected to the magnetic element and the gate of the input stage MOS transistor so that the input signal from the magnetic element is supplied to the gate of the input stage MOS transistor.

Id. at 8.

The term “amplifier” should be accorded its plain and usual meaning. NVE’s definition again attempts to import limitations from the specifications that are not clearly indicated by the claim language, namely, the specifications description that the amplifier is of a particular type. But the specification supports giving “amplifier” its plain meaning. The description of preferred embodiments simply describes the amplifier sensing voltage at its input and amplifying that signal at its output. ’920 Patent at 4:3-9. The patentee makes no suggestion that “amplifier” should be construed in any special or restricted manner. Since there is no indication from the patentee in the claim language or the specification that the plain and usual meaning is disavowed, finding a definition by implication would be improper.

The “amplifier” phrases should be considered as a whole. Everspin argues that excising “the input being coupled to the magnetic element” would help simplify the claim language and help a jury better understand the invention. But, the excised language is not particularly confusing. In addition excising the above language removes an important limitation on the claim. The phrases “an amplifier having an input, the input being coupled to the magnetic

element, for sensing resistance in the magnetic element” is substantially different than the shortened phrase “an amplifier having an input . . . for sensing resistance in the magnetic element.” The claim makes clear that the input of the amplifier must have some connection, direct or indirect, to the magnetic element in Claim 1. The phrase should be read as a whole and given its plain meaning. Once again, NVE cannot, based simply on the preferred embodiments, further restrict the definition of the phrase when the patentee has given no indication that the claim language should be considered in a narrower sense than what is stated.

**6. “A charges dissipating circuit, . . . for dissipating charges applied to the input”; and “a charges dissipating circuit, coupled to the input of the amplifier, for dissipating charges applied to the input” in Claim 1 of the ’920 Patent**

Everspin asks the Court to construe in Claim 1 the phrase, “a charges dissipating circuit, . . . for dissipating charges applied to the input” and argues that it means “a circuit for dissipating or discharging electric charges to protect the input from high positive and negative voltages.” Joint Stmt. at 8-10. NVE asks the Court to construe the whole phrase “a charges dissipating circuit, coupled to the input of the amplifier, for dissipating charges applied to the input,” and argues that it means:

A circuit capable of discharging electric charges funneled to the gate terminal of the input stage MOS transistor of the amplifier.

The charges dissipating circuit is connected to the same input of the amplifier as the magnetic element.

Id. at 10.

The parties’ arguments are very similar to the ones expressed for the “amplifier” phrases above. The conclusion is also the same. The phrase should be read as a whole and given its plain and usual meaning. Everspin’s excising of the phrase, “coupled to the input of the amplifier” suggests a broader definition than the claim language warrants. On the other hand,

NVE's definition is unwieldy and attempts to improperly add limitations from the specification and embodiments. The "charges dissipating circuit" phrase will have its plain meaning.

#### **IV. CONCLUSION**

Based upon the foregoing, and all of the files, records and proceedings herein, **IT IS HEREBY ORDERED** that, in interpreting the '328 Patent and the '920 Patent, the contested terms be construed in accordance with this Order.

BY THE COURT:

s/Ann D. Montgomery  
ANN D. MONTGOMERY  
U.S. DISTRICT JUDGE

Dated: October 8, 2013.